

Unit 4: Chemical Reactions:

- In these, substances present at the beginning of the reaction are changed into something new.
- Essentially, we are breaking bonds and creating new ones.
- All chemical properties are a result of chemical reactions.
 - Happens when you make or break bonds.
 - Involves rearrangement of atoms.
- One set of compounds (reactants) forms another set of compounds (products).

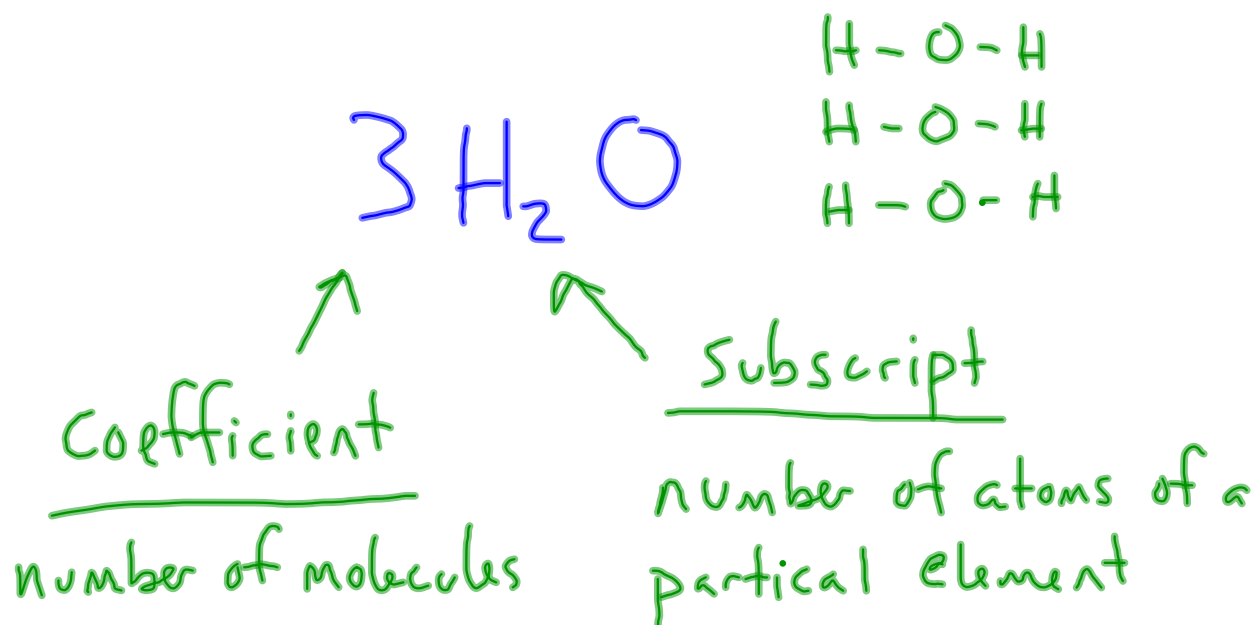
- Example:



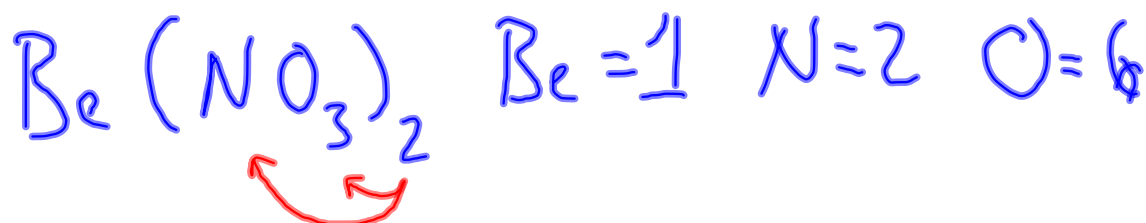
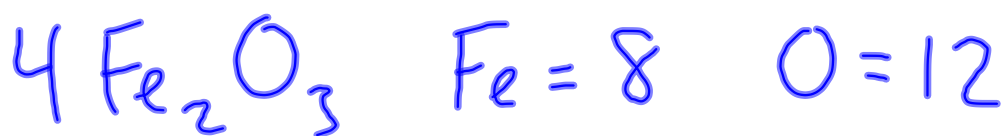
Balanced Chemical Equation

- Law of Conservation of Matter
 - Matter can be neither created nor destroyed.
 - This law allows us to balance chemical equations, because we know number of atoms on the reactant side MUST equal number of atoms on product side.

- Before we start balancing...



- Practice



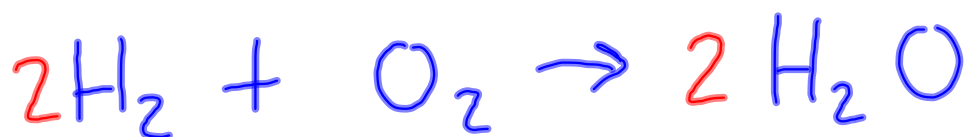
- Balanced Equations:

- To conserve atoms, we must have the same number on reactant and product sides.

- Writing chemical equations:

- Reactants on left
- Products on right
- Symbols show what is happening
 - + added to, mixed with
 - forms, produces, yields
- Label physical state
 - s = solid
 - l = liquid
 - g = gas
 - aq = aqueous solution
 - compound in solution with water

- Balancing Equations:



Reactants Elements Products

| | | | | |
|---|--------------|---|--------------|---|
| 4 | 2 | H | 2 | 4 |
| 2 | | O | 1 | 2 |

Equation is now balanced!

- Rules:

1. Cannot change subscripts.

2. Can (will, must) change the coefficients.

— Number of atoms will always increase → we cannot take away atoms

• Examples:

